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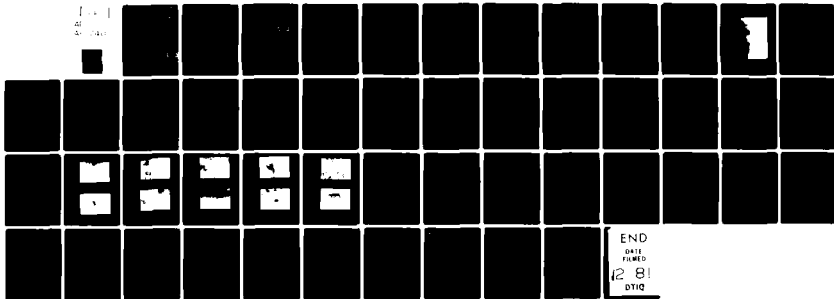
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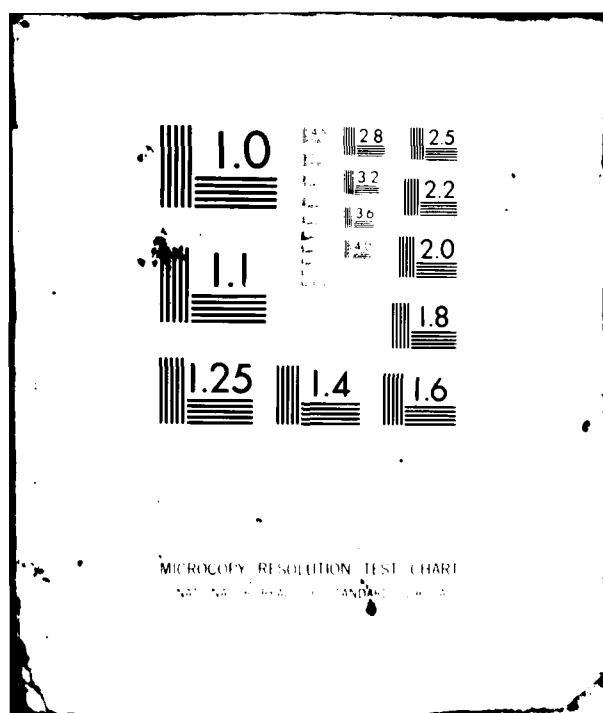
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LONG ISLAND BASIN

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PATERNO DAM

WESTCHESTER COUNTY, NEW YORK
INVENTORY NO. N.Y. 101

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM



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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Phase I investigation of Paterno Dam did not indicate conditions which constitute an immediate hazard to human life or property. Based on engineering judgment and the performance of the dam, the project appears to be in fair condition. The		

project, however, does have inadequacies which if not remedied, have the potential for developing into hazardous conditions.

Using the Corps of Engineers Screening Criteria for review of spillway adequacy, it has been determined that the spillway is adequate for half (½) PMF and PMF. The spillway is therefore judged to be adequate.

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LONG ISLAND BASIN

PATERNO DAM

**WESTCHESTER COUNTY, NEW YORK
INVENTORY NO. N.Y. 101**

**PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM**



NEW YORK DISTRICT CORPS OF ENGINEERS

SEPTEMBER 1981

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D. C., 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, and analyses involving topographic mapping, sub-surface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
PATERNO DAM
I.D. NO. N.Y. 101
D.E.C. NO. 232-961
LONG ISLAND BASIN
WESTCHESTER COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NAME OF DAM: Paterno Dam (N.Y. No. 101)
STATED LOCATED: New York
COUNTY LOCATED: Westchester
STREAM: None
BASIN: Long Island
DATE OF INSPECTION: 14 May 1981

ASSESSMENT

Phase I investigation of Paterno Dam did not indicate conditions which constitute an immediate hazard to human life or property. Based on engineering judgment and the performance of the dam, the project appears to be in fair condition. The project, however, does have inadequacies which if not remedied, have the potential for developing into hazardous conditions.

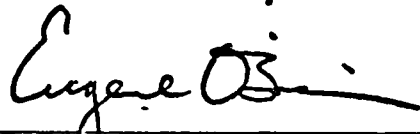
Using the Corps of Engineers Screening Criteria for review of spillway adequacy, it has been determined that the spillway is adequate for half ($\frac{1}{2}$) PMF and PMF. The spillway is therefore judged to be adequate.

The seepage condition which exists at the toe, downstream of the dam and along the reservoir drain should be investigated to determine the cause, the stability of the structure under the seepage forces, and to provide remedial measures if required. It is recommended that within 3 months of notification to the owner, an in-depth engineering investigation should be undertaken to determine their affect on the safety of the structure. The investigation should include, but not be limited to, borings in the embankment and foundation to determine the material properties, locating of springs which exist in the area, installation of piezometers within the embankment and downstream of the dam and stability and seepage analyses. Within 18 months of the date of notification to the owner, modifications to the structure deemed necessary as a result of these studies, should have been completed. In the interim, provide a system of weirs or other measuring devices to measure quantities of flow.

In addition, the dam has other problem areas which if left uncorrected, have the potential to develop into hazardous


conditions and must be corrected within one year. These areas are:

1. The spillway reservoir drain should be made operational. The drain outlet should be located, and the area around the structure should be regraded such that the outlet is exposed and can be inspected and/or repaired.
2. Provide positive access to the intake structure from the embankment. Extend the reservoir drain gate stem so that it can be operated from the top of the structure.
3. Heavy brush, shrubs and trees must be removed from all locations on the embankment. Provide a program of periodic cutting and mowing of the embankment surfaces.
4. Provide additional riprap along the upstream slope at locations where the existing riprap is inadequate.
5. Repair the concrete surfaces of the spillway intake structure.
6. Regrade the crest of the embankment, particularly near the left abutment, to prevent future puddling.
7. Provide a program of periodic inspection and maintenance of the dam and its appurtenances, including yearly operation and lubrication of the reservoir drain and its control facilities. Document this information for future reference. Develop an emergency action plan and periodically update the plan during the life of the structure.



Eugene O'Brien, P.E.
New York No. 29823

Approved By:



Col. W.M. Smith, Jr.
New York District Engineer

Date:

19 AUG 1981



OVERVIEW

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
PATERNO DAM
I.D. NO. N.Y. 101
D.E.C. NO. 232-961
LONG ISLAND BASIN
WESTCHESTER COUNTY, NEW YORK

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers Contract No. DACW 51-81-C-0008 in a letter dated 14 December 1980 in fulfillment of the requirements of the National Dam Inspection Act, Public Law 91-367 dated 8 August 1972.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing condition of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property and to recommend remedial measures where required.

1.2 DESCRIPTION OF THE PROJECT

a. Description of the Dam and Appurtenant Structures

Paterno Dam is an earth embankment approximately 400 feet long with an approximate maximum height of 25 feet. The crest of the dam is grassed and is approximately 70 feet wide. The downstream slope varies from 1V:1.5 to 2.0H (Vertical to Horizontal). The upstream slope varies from 1V:2 to 2.5H and is partially protected with riprap. The dam is dog-legged; the break in the alignment occurs near the approximate center of the dam.

A reinforced concrete intake structure is located about 25 feet from the upstream crest edge at the approximate maximum section of the dam. The structure has an opening at the top, 6 ft x 5 ft, and acts as the principal spillway for the project. A metal and wood trash rack is located at the top of the structure. Discharge is controlled by a manually operated center-rising screw which is housed in the intake structure. The valve controls a vertical sliding gate located at the base of the structure. Stoplog slots exist along the

outside surface of the structure thus enabling the pipe to act as either a spillway discharge pipe or a reservoir drain. An 18 inch diameter pipe is located at the base of the structure.

b. Location

The dam is located on the property of Mr. and Mrs. James Robison, 12 Spruce Road, Armonk, New York at the Windmill Farms Housing Community located immediately off New York Route 22. The dam is approximately 0.5 miles north of the Village of North Castle, Westchester County, New York.

c. Size Location

The dam is 25 feet high and the reservoir has a storage capacity of 35 acre-feet. The dam is classified as "small" in size.

d. Hazard Classification

The dam is classified as high hazard due to the large number of homes located immediately downstream of the dam.

e. Ownership

The dam is owned and maintained by Mr. and Mrs. Robison, 12 Spruce Road, Armonk, New York 10504, Telephone No. (914) 273-8711.

f. Purpose of Dam

The impoundment provided by the dam is used for recreational purposes.

g. Design and Construction History

There are no available design or construction data for the project. According to Mrs. Robison, the dam was constructed prior to 1950 by the Circle Construction Company, a local contractor, for Dr. Chas. Paterno, who previously owned the land.

h. Normal Operating Procedure

Water release from the lake is through the outlet pipe at the base of the intake structure. It is unknown as to whether the pipe is operational.

1.3 PERTINENT DATA

a.	<u>Drainage Area</u> (acres)	10.1
b.	<u>Discharge at Damsite</u> (cfs)	
	Maximum Known Flood	Unknown
	Drop Inlet	Unknown
c.	<u>Elevation</u> (USGS Datum)	
	Top of Embankment (Maximum Pool)	627.5
	Top of Intake Spillway	625
	Spillway Pipe Invert	Unknown
d.	<u>Reservoir</u>	
	Length of Maximum Pool (feet)	600
	Surface Area (acres)	7.35
e.	<u>Storage</u> (acre-feet)	
	Reservoir at Spillway Crest	35
	Reservoir at Maximum Pool	53.52
f.	<u>Embankment</u>	
	Type	Earthfill
	Length (feet)	400
	Upstream Slope (V:H)	1:2 to 2.5
	Downstream Slope (V:H)	1:1.5 to 2.0
	Height (feet)	25
	Crest Width (feet)	70 (average)
g.	<u>Spillway Intake Structure</u>	
	Type	Reinforced concrete intake with 18 inch pipe located at base
	Intake Dimension (ft x ft)	6 x 5
	Height (feet)	15 (approx.)
h.	<u>Spillway Reservoir Drain</u>	
	Type	Unknown
	Diameter (inch)	18
	Control	Sliding Gate with Center Rising Screw

SECTION 2 - ENGINEERING DATA

2.1 GEOLOGY

Paterno Dam is located in the New England Upland Section of the New England Maritime Physiographic Province (Ref. 4). The bedrock in this Section consists of metamorphic, igneous, and sedimentary rocks which have undergone a complex sequence of deposition, folding, faulting and erosion. The rock at the damsite is Fordham Gneiss of Precambrian Age (Ref. 5); rock islands were observed in the lake area.

2.2 SUBSURFACE INVESTIGATIONS

There are no subsurface investigation data available for the project. The surface soils of this Section are of glacial origin and are composed of sands, silts and gravels.

2.3 DAM AND APPURTENANT STRUCTURES

There are neither design records nor drawings showing the plan and details of the dam available for the project. In addition there are no previous inspection reports for the project.

2.4 CONSTRUCTION RECORDS

No information has been located in relation to the construction of the dam and its appurtenances. According to Mrs. Robison, the height of the embankment and intake structure were decreased in order that embankment material could be made available for the construction of nearby Long Pond Dam.

2.5 OPERATIONS RECORDS

There are no operation records kept for the project. According to Mrs. Robison, the spillway pipe has not been operated for years; it is uncertain as to whether the pipe is operational.

2.6 EVALUATION OF DATA

The information obtained from personal interviews and a visual inspection is considered adequate for a Phase I inspection and evaluation.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

A visual inspection of Paterno Dam was made on 14 May 1981. The weather was partly cloudy and the temperature was 65° F. At the time of the inspection, the reservoir level was approximately 2 feet below the crest of the intake structure.

b. Embankment

The overall condition of the dam is fair. The crest of the dam is grassed and well-maintained. Some puddling occurs at the crest near the left abutment. (See PHOTOGRAPH 2). A small vegetable garden is located on the crest near the left abutment.

The upstream slope of the dam contains vegetation consisting of small brush to trees 12 inches in diameter (See PHOTOGRAPH 4). Riprap exists along the upstream slope and is in fair condition; there are some locations, however, where the riprap is inadequate (See PHOTOGRAPH 3). The downstream slope of the dam contains small brush to large diameter trees 24 inches in diameter (See PHOTOGRAPHS 4 & 5).

Extensive areas of dampness and puddling were observed at the downstream toe and downstream of the dam. (See PHOTOGRAPHS 9 & 10). It is reported that many springs exist in the area, therefore, it is uncertain whether this condition is due to seepage beneath the dam or discharge from local springs. The downstream slope appears to be stable with no evidence of sloughing or slope instability. No boils due to excessive pressures were observed downstream of the dam.

No emergency action plan exists for the project.

c. Spillway Intake Structure

The overall condition of the spillway intake structure is fair (See PHOTOGRAPH 6). The exterior reinforced concrete surfaces are separating from the structure. The corners at the top of the structure are also deteriorated (See PHOTOGRAPH 7). The concrete surfaces inside the structure are in relatively good condition, with no visible signs of structural distress.

The metal mesh and wood frame trash rack located at the top of the intake structure is in fair condition.

d. Spillway Reservoir Drain

The reservoir drain inlet and sluice gate could not be observed during this inspection due to the height of the water level in the intake chamber. According to Mrs. Robison, the drain has not been operated for some time. The gate stem is located within the intake structure at its approximate mid-height. Access to the structure is by boat.

e. Downstream Channel

The downstream channel for the spillway reservoir drain could not be located due to the vegetation. A stone-filled area downstream of the intake structure (about 70 ft from the downstream toe) had some discharge (See PHOTOGRAPH 8), however, it is uncertain as to whether this is due to discharge from the drain local seepage, natural spring discharge, or leakage around the reservoir drain pipe.

f. Reservoir

The reservoir is bordered primarily by the property of the Robison family, 12 Spruce Road, Armonk, New York. According to Mrs. Robison, the reservoir is spring-fed. There are no visible signs of sedimentation problems in the reservoir area.

g. Abutments

Each of the abutment contacts appear to be in good condition. No seepage or erosional features were observed.

3.2 EVALUATION OF OBSERVATIONS

Significant conditions were observed which require immediate investigation to determine the extent of corrective action necessary to determine the safety of the structure. The following is a summary of the problem areas encountered, in order to importance, with the appropriate remedial action:

1. The wetness, puddling and seepage (or spring discharge) at the toe of the dam and downstream of the toe should be investigated immediately to determine the cause of this condition. Weirs or other measuring devices should be constructed and flow should be recorded at bi-weekly intervals to determine the extent of this condition.

2. The spillway reservoir drain should be made operational. The drain outlet should be located, and the area around the structure should be regraded such that the outlet is exposed and can be inspected and/or repaired.

3. Provide positive access to the intake structure from the embankment. Extend the reservoir drain gate stem so that it can be operated from the top of the structure.

4. Heavy brush, shrubs and trees must be removed from all locations on the embankment. Provide a program of periodic cutting and mowing of the embankment surfaces.

5. Provide additional riprap along the upstream slope at locations where the existing riprap is inadequate.

6. Repair the concrete surfaces of the spillway intake structure.

7. Regrade the crest of the embankment, particularly near the left abutment, to prevent future puddling.

8. Provide a program of periodic inspection and maintenance of the dam and its appurtenances, including yearly operation and lubrication of the reservoir drain and its control facilities. Document this information for future reference. Develop an emergency action plan and periodically update the plan during the life of the structure.

SECTION 4 - OPERATIONS AND MAINTENANCE

4.1 PROCEDURES

It has been reported that the spillway reservoir drain has not been operated for years. Since the outlet could not be located, it is uncertain as to whether the gate is opened or closed or to the hydraulic capability of the pipe. As previously reported in Section 3, there is an area downstream which may be the location of the reservoir drain outlet, and since flow was observed in this area, it could indicate that the drain is operational or that leakage exists around the pipe. However, due to the presence of springs in the area, this conclusion can not be made without a more detailed investigation.

4.2 MAINTENANCE OF THE DAM

The Robison family employs full-time ground keepers which care for the family property. Maintenance of the dam is performed on a regular as needed basis.

4.3 WARNING SYSTEM IN EFFECT

No warning system is in effect or preparation.

4.4 EVALUATION

The overall maintenance of the dam is considered to be inadequate, as mentioned in Section 3.

SECTION 5 - HYDROLOGY/HYDRAULICS

5.1 DRAINAGE BASIN CHARACTERISTICS

Paterno Dam is located south of Windmill Lake in the North Castle Township, Westchester County, New York. The Hydrologic Unit Code Number is 01100006. The drainage basin has an area of 10.1 acres, out of which 7.35 acres (73%) is occupied by the pond. The basin is located at the top of a hill without having any noticeable outflow channel. It is circular in shape with the reservoir spillway being the only outlet.

5.2 ANALYSIS CRITERIA

The analysis is based on the Probable Maximum Precipitation (PMP). The all season 200 sq. miles 24 hours PMP for this area is 22 inches according to the Weather Bureau Report. Assuming no loss of rain in the basin, this PMP produced 18.52 acre-feet of runoff.

5.3 SPILLWAY CAPACITY

The reservoir has an outlet structure which consists of 6 ft x 5 ft and 15 ft deep concrete box with an 18-inch diameter outflow pipe at the base of the structure. The pipe outlet could not be observed during the visual inspection. For this investigation, no flow was assumed through the pipe.

5.4 RESERVOIR CAPACITY

The surcharge storage due to the PMP is computed as 18.52 acre-feet which will raise the water surface level by 2.5 feet (assuming no outflow).

5.5 FLOODS OF RECORD

No record of floods or maximum lake elevations is available.

5.6 OVERTOPPING POTENTIAL

The difference in elevation between the normal water surface level (625 feet) and top of dam (627.5 feet) is 2.5 feet and therefore, the dam will not be overtopped during the PMF event.

5.7 EVALUATION

The dam is adequate for the Probable Maximum Flood (PMF).

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

The earth embankment did not show any signs of major distress. Seepage (or spring discharge) was observed, however, at the downstream toe and downstream of the dam. Although there was no sign of erosive action or high exit gradients, a seepage condition, if left uncorrected, could potentially affect the stability of the dam.

b. Design and Construction Data

No design computations or construction data are available for the project.

c. Operating Records

No operating records are kept for the project.

d. Post-Construction Changes

It has been reported that the embankment and intake structure were lowered, in order that the embankment material could be used to construct Long Pond Dam.

e. Seismic Stability

In accordance with recommended Phase I guidelines, the dam is located in Seismic Risk Zone No. 1. In accordance with these guidelines, a stability is beyond the scope of work.

SECTION 7 - ASSESSMENT/RECOMMENDATION

7.1 ASSESSMENT

a. Safety

Examination of the available documents and the visual inspection of Paterno Dam did not reveal any conditions which constitute an immediate hazard to life or property. However, the dam does have deficiencies and inadequacies, which if left uncorrected, have the potential for developing into hazardous conditions.

Using the Corps of Engineers Screening Criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped for the half ($\frac{1}{2}$) PMF and PMF. The intake structure is therefore judged to be adequate.

Seepage (or spring discharge) was observed at the downstream toe and downstream of the dam. Although there were no signs of erosive action or high exit gradients, a seepage condition, if left uncorrected, could potentially affect the stability of the dam.

b. Adequacy of Information

The information obtained from the visual inspection, interviews and hydrologic/hydraulic studies was considered adequate for a Phase I evaluation.

c. Need for Additional Investigations

Since either seepage or spring discharge is occurring at the downstream toe and downstream of the dam, an in-depth engineering investigation should be undertaken to determine its affect on the safety of the structure. At the same time, the leakage condition which may exist along the reservoir drain should be investigated. The above investigations should include, but not be limited to, borings in the embankment and foundation to determine material properties, locating of springs which exist in the area, installation of piezometers within the embankment and downstream of the dam and stability and seepage analyses. Remedial measures, if required, should be proposed to prevent these conditions from developing into hazardous conditions.

d. Urgency

The additional required investigation described above must be initiated within 3 months from the date of notification. Within 18 months of notification, remedial measures as a result

of this investigation must be initiated, with completion of these measures within the following year. In the interim, develop a system as described below for monitoring this condition. The other deficiencies as reported below must be corrected within one year of notification.

7.2 RECOMMENDED MEASURES

1. The results of the aforementioned seepage investigation at the downstream toe, downstream of the dam, and along the reservoir drain will determine the required remedial measures.

2. Monitor at bi-weekly intervals with the aid of weirs and/or other measuring devices, the quantity and quality of seepage which is occurring downstream of the dam.

3. The spillway reservoir drain should be made operational. The drain outlet should be located, and the area around the structure should be regraded such that the outlet is exposed and can be inspected and/or repaired.

4. Provide positive access to the intake structure from the embankment. Extend the reservoir gate stem so that it can be operated from the top of the structure.

5. Heavy brush, shrubs and trees must be removed from all locations on the embankment. Provide a program of periodic cutting and mowing of the embankment surfaces.

6. Provide additional riprap along the upstream slope at locations where the existing riprap is inadequate.

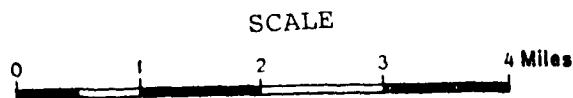
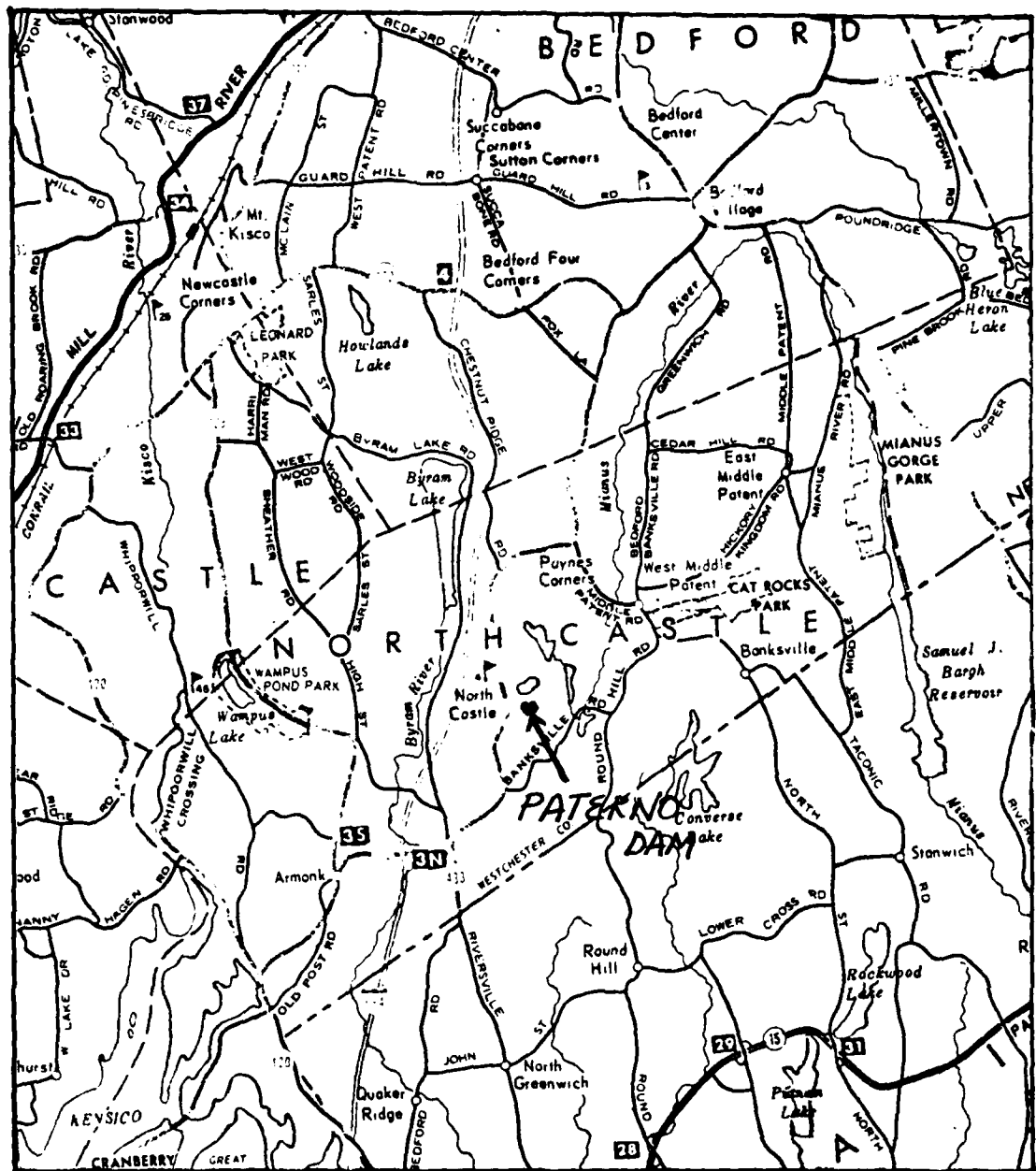
7. Repair the concrete surfaces of the spillway intake structure.

8. Regrade the crest of the embankment, particularly near the left abutment, to prevent future puddling.

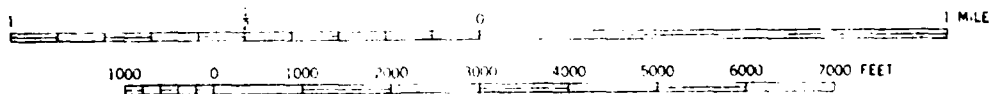
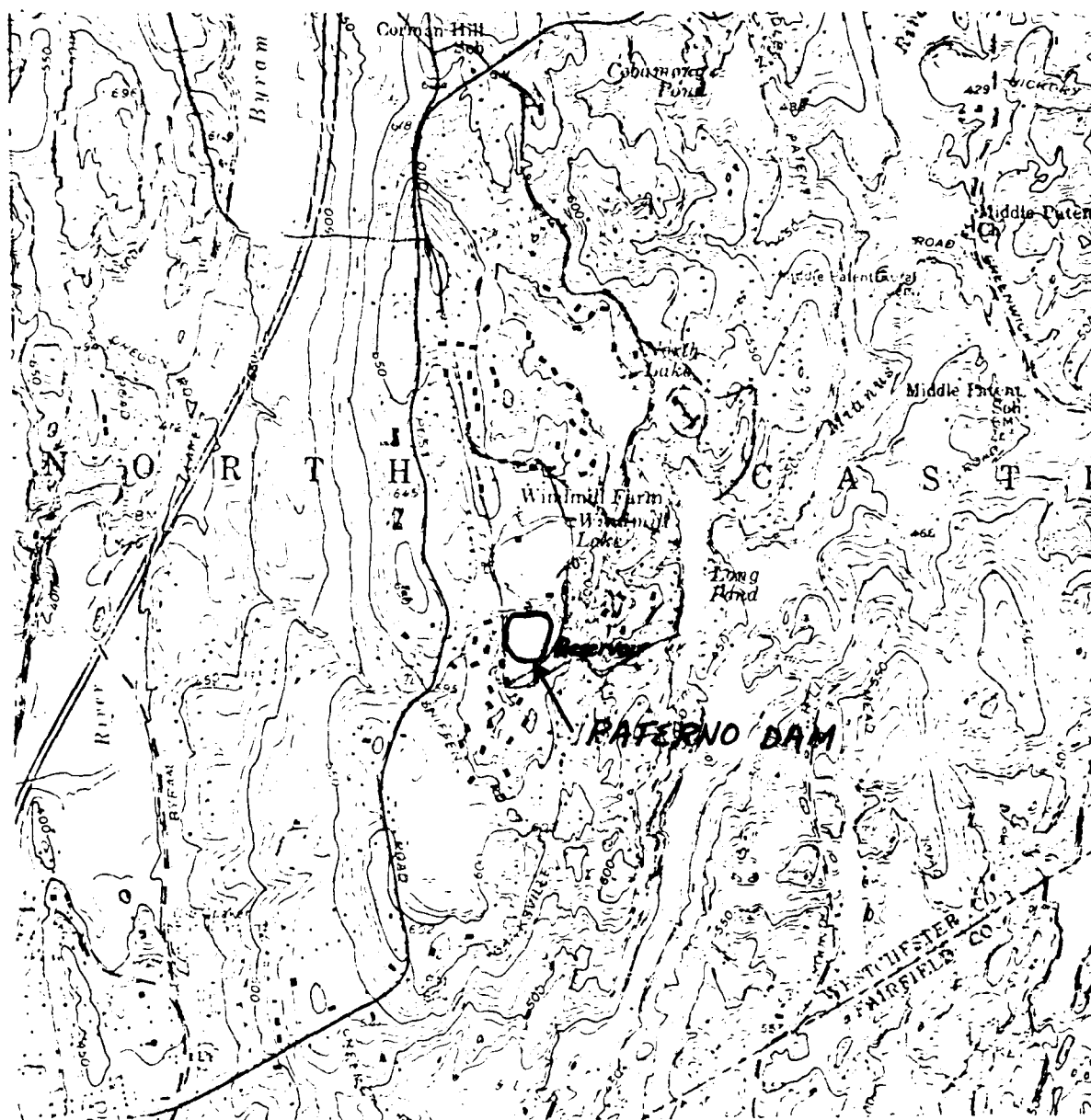
9. Provide a program of periodic inspection and maintenance of the dam and its appurtenances, including yearly operation and lubrication of the reservoir drain and its control facilities. Document this information for future reference. Develop an emergency action plan and periodically update the plan during the life of the structure.

DRAWINGS

APPENDIX A



VICINITY MAP
PATERNO DAM



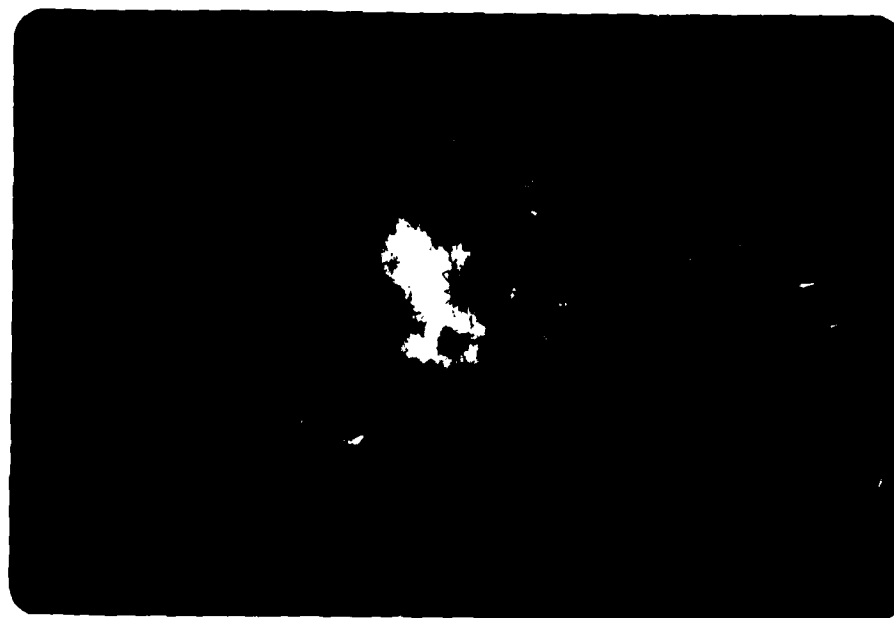
TOPOGRAPHIC MAP
PATERNO DAM

PHOTOGRAPHS

APPENDIX B



1. CREST OF DAM.



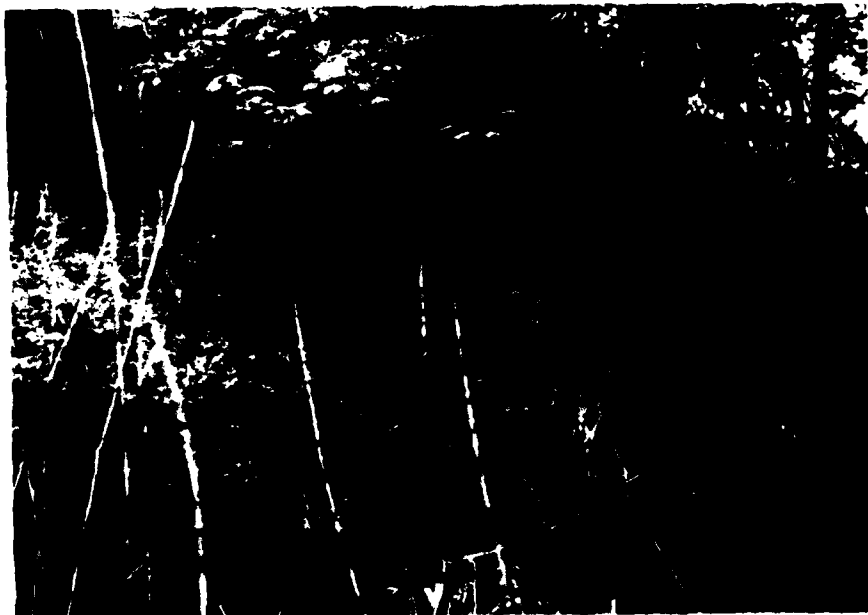
2. PUEBLING ALONG CREST OF DAM, NEAR
LEFT ABUTMENT.



3. UPSTREAM SLOPE (OBSERVE RIPRAP AND VEGETATION) .



4. VEGETATION DOWNSTREAM OF DAM.



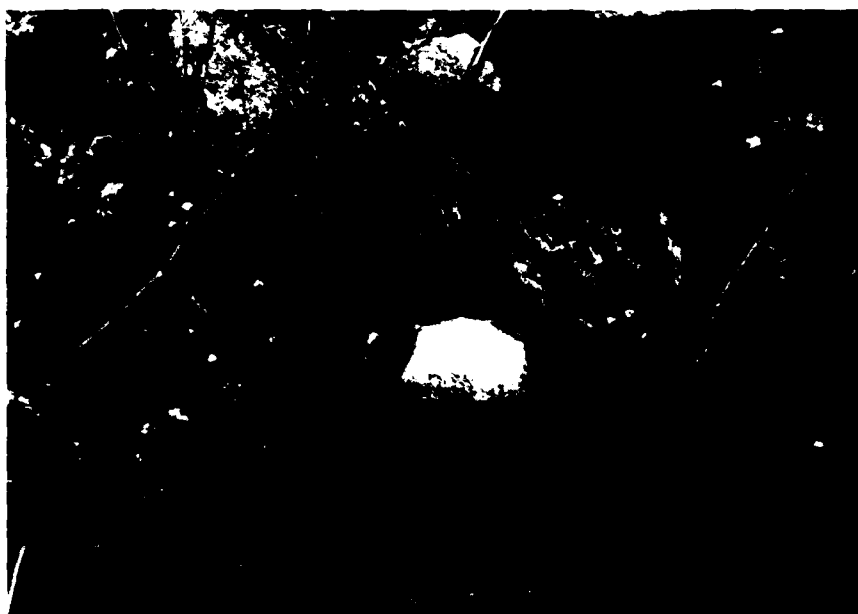
5. VEGETATION ALONG DOWNSTREAM SLOPE OF DAM.



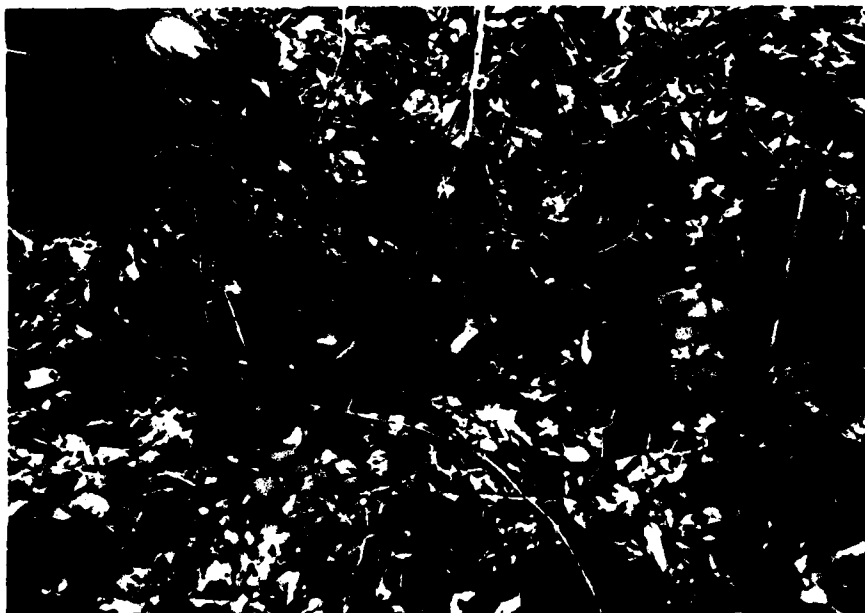
6. CONCRETE INTAKE STRUCTURE WITH WOOD
AND MESH ROCK.



7. CONDITION OF CONCRETE SURFACES OF INTAKE
STRUCTURE.



8. PROBABLE LOCATION OF RESERVOIR DRAIN OUTLET.



9. SEEPAGE (OR SPRING) LOCATED DOWNSTREAM OF DAM.



10. SWAMP-LIKE AREA LOCATED IMMEDIATELY DOWN-
STREAM OF DAM.

VISUAL INSPECTION CHECKLIST

APPENDIX C

VISUAL INSPECTION CHECKLIST

Basic Data

a. General

Name of Dam Paterno Dam
Fed. I.D. # N.Y. 101 DEC Dam No. 232-961
River Basin None
Location: Town Armonk County Westchester
Stream Name None
Tributary of None
Latitude (N) 41° 08' 30" Longitude (W) 73° 40.9'
Type of Dam Earth
Hazard Category High
Date(s) of Inspection 14 May 1981
Weather Conditions Sunny, 60°F
Reservoir Level at Time of Inspection 2.5 feet below intake crest

b. Inspection Personnel Mr. Harvey Feldman and Mr. Albert
DiBernardo

c. Persons Contacted (Including Address & Phone No.)
Ms. Robison
12 Spruce Hill Road
Armonk, New York 10504
(914) 273-8711

d. History:

Date Constructed Unknown Date(s) Reconstructed Unknown

Designer Unknown

Constructed By Circle Construction Company

Owner Mr & Mrs. Robison, 12 Spruce Hill Road, Armonk, New York

2) Embankment

a. Characteristics

- (1) Embankment Material Earth, according to Ms Robison and her grounds keeper, the dam is constructed of ^{gray} clay. Visual inspection indicates that the dam is constructed of sandy silt.
- (2) Cutoff Type None
- (3) Impervious Core The dam is constructed of gray clay or sandy silt, as reported above. There is no evidence that a core zone exists within the embankment.
- (4) Internal Drainage System None
- (5) Miscellaneous None

b. Crest

- (1) Vertical Alignment The dam is slightly depressed at certain locations along the centerline of the crest. Puddling results
- (2) Horizontal Alignment The horizontal alignment appears good. The dam is dog-legged at its approximate center
- (3) Surface Cracks None observed
- (4) Miscellaneous The crest of the embankment is grassed and well-maintained.

c. Upstream Slope

- (1) Slope (Estimate) (V:H) 1:2 to 2.5 measured
- (2) Undesirable Growth or Debris, Animal Burrows Some vegetation consisting of small brush to trees approximately 12 inches in diameter
- (3) Sloughing, Subsidence or Depressions None observed, however, only the upper four feet of the upstream slope could be observed at the time of this inspection

- (4) Slope Protection Consists of stone riprap. Portions of the slope require additional stone, since the slope is sparsely protected at certain locations.
- (5) Surface Cracks or Movement at Toe None observed

d. Downstream Slope

- (1) Slope (Estimate - V:H) 1V: 1.5 to 2.0 H
- (2) Undesirable Growth or Debris, Animal Burrows Small brush to large diameter trees exist along downstream slope
- (3) Sloughing, Subsidence or Depressions None observed. Vegetation remains vertical at observed locations indicating no movements
- (4) Surface Cracks or Movement at Toe None observed
- (5) Seepage Seepage (puddling, wet-like areas and/or springs) were observed at the emb^{mt} toe & d/s of the emb^{mt} at the approximate maximum section of the dam
- (6) External Drainage System (Ditches, Trenches; Blanket) None
- (7) Condition Around Outlet Structure The outlet structure (spillway reservoir drain) could not be located
- (8) Seepage Beyond Toe Flow was observed at the believed-to-be location of the outlet pipe. It is uncertain as to whether this is a spring, discharge thru the outlet (or around) or seepage
- e. Abutments & Embankment Contact

The abutments are formed into the natural ground surface which is believed to be of earth

(1) Erosion at Contact None observed

(2) Seepage Along Contact None observed

3) Drainage System

a. Description of System None

b. Condition of System Not Applicable

c. Discharge from Drainage System Not Applicable

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

None

5) Reservoir

- a. Slopes The reservoir is bounded by the dam to the south and east and by a highway emb't to the north. No signs of instability.
- b. Sedimentation The reservoir is spring fed. There are no visible signs of sedimentation.
- c. Unusual Conditions Which Affect Dam The location of the springs in the area is uncertain and may affect the safety of the dam.

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) At least 10 homes are d/s as well as some local roadways.
- b. Seepage, Unusual Growth See 2(d)
- c. Evidence of Movement Beyond Toe of Dam None observed
- d. Condition of Downstream Channel There is really no defined downstream channel.

7) Spillway(s) (Including Discharge Conveyance Channel)

- The spillway consists of a ^{rectangular} concrete intake structure and a reservoir drain.
- a. General The intake structure is constructed on concrete. Its opening dimensions are 6'x5'; the opening is protected by a metal and wood trash rack. The drain is operated by a sliding gate stem located within the chamber. Stop log slots exist along one side of the structure.
 - b. Condition of Service Spillway The overall condition is fair. The exterior reinforced concrete surfaces are separating from the structure. The corners at the top of the structure are also deteriorated. The concrete surfaces inside the structure are in relatively good condition, with no visible signs of structural stress. The trash rack at the top of the structure is in fair condition.

c. Condition of Auxiliary Spillway None

d. Condition of Discharge Conveyance Channel None

Reservoir Drain/Outlet

Type: Pipe ☒ Conduit _____ Other _____

Material: Concrete _____ Metal _____ Other Unknown

Size: 18" Length Unknown

Invert Elevations: Entrance Unknown Exit Unknown

Physical Condition (Describe): _____ Unobservable ☒

Material: Not Applicable

Joints: N.A. Alignment N.A.

Structural Integrity: Unknown

Hydraulic Capability: It is unknown as to whether the drain is operational

Means of Control: Gate ☒ Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Other Unknown

Present Condition (Describe): Partly maintained gate stem

Structural

a. Concrete Surfaces Not Applicable

b. Structural Cracking Not Applicable

c. Movement - Horizontal & Vertical Alignment (Settlement) Not Applicable

d. Junctions with Abutments or Embankments Not Applicable

e. Drains - Foundation, Joint, Face Not Applicable

f. Water Passages, Conduits, Sluices Not Applicable

g. Seepage or Leakage Not Applicable

h. Joints - Construction, etc. Not Applicable

i. Foundation Not Applicable

j. Abutments Not Applicable

k. Control Gates Not Applicable

l. Approach & Outlet Channels Not Applicable

m. Energy Dissipators (Plunge Pool, etc.) Not Applicable

n. Intake Structures Not Applicable

o. Stability Not Applicable

p. Miscellaneous Not Applicable

10) Appurtenant Structures (Powerhouse, Lock, Gatehouse, Other)

a. Description and Condition

See previous descriptions, where applicable

HYDROLOGIC DATA AND COMPUTATIONS

APPENDIX D

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

1

AREA-CAPACITY DATA:

	<u>Elevation (ft.)</u>	<u>Surface Area (acres)</u>	<u>Storage Capacity (acre-ft.)</u>
1) Top of Dam	<u>627.5</u>	<u>7.35</u>	<u>53.52</u>
2) Design High Water (Max. Design Pool)	<u>Unknown</u>	<u>Unknown</u>	<u>Unknown</u>
3) Auxiliary Spillway Crest	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>
4) Pool Level with Flashboards	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>
5) Service Spillway Crest	<u>625</u>	<u>7.35</u>	<u>35 (assumed)</u>

DISCHARGES

	<u>Volume (cfs)</u>
1) Average Daily	<u>Unknown</u>
2) Spillway @ Maximum High Water	<u>Unknown</u>
3) Spillway @ Design High Water	<u>Unknown</u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u>N.A.</u>
5) Low Level Outlet	<u>Unknown</u>
6) Total (of all facilities) @ Maximum High Water	<u>Unknown</u>
7) Maximum Known Flood	<u>Unknown</u>
8) At Time of Inspection	<u>Unknown</u>

CREST:

ELEVATION: 627.5Type: EarthWidth: 70' (average) Length: 400'Spillover Concrete intake structureLocation Upstream Slope

SPILLWAY:

SERVICE

AUXILIARY

625

Elevation

N.A.Concrete Intake Structure TypeN.A.6' x 5'

Width

N.A.

Type of Control

Concrete Intake Structure UncontrolledN.A.with Reservoir Drain atBase controlled by a sliding Controlled:gateN.A.

Type

N.A.

(Flashboards; gate)

Number

Size/Length

Invert Material

Anticipated Length
of operating serviceN.A.

Chute Length

N.A.N.A.Height Between Spillway Crest
& Approach Channel Invert
(Weir Flow)N.A.

HYDROMETEROLOGICAL GAGES:

Type : None

Location: N.A.

Records:

Date - N.A.

Max. Reading - N.A.

FLOOD WATER CONTROL SYSTEM:

Warning System: None in effect or preparation

Method of Controlled Releases (mechanisms):

Sliding gate regulated reservoir drain
at base of concrete intake structure

4
DRAINAGE AREA: 10.1 acres

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: There is no drainage basin, only rainfall
Terrain - Relief: contributes to lake level increase in elevation

Surface - Soil: Glacial origin

Runoff Potential (existing or planned extensive alterations to existing
(surface or subsurface conditions)

The lake is spring fed as reported by Mrs.
Robison at the time of this inspection

Potential Sedimentation problem areas (natural or man-made; present or future)

None

Potential Backwater problem areas for levels at maximum storage capacity
including surcharge storage:

None

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the
Reservoir perimeter:

Location: None

Elevation: None

Reservoir:

Length @ Maximum Pool 600 feet (miles)

Length of Shoreline (@ Spillway Crest) 2400 feet (miles)

TAMS

Job No. 1579-02

Project Paterno Dam

Subject Hydrology / Hydraulic Study

Sheet 1 of 1

Date 6/18/81

By D.K. Boral

Ch'k. by

Normal Lake Elevation = 625 ft. (USGS)

Normal Lake Surface Area = (0.08×91.827) Acre

= 7.35 Acre

= 0.0115 sq. mile

Drainage area = (0.11×91.827) Acre

= 10.1 Acre

= 0.0158 Sq. mile

In this area, 24 hour PMP is 22 inches.

Assuming no loss of rain in the basin,
the PMP produces 18.52 Ac. Ft. of runoff.

This will raise the water surface elevation
of the lake by 2.5 ft. assuming no
outflow.

Hydrologic Unit Code. 01100006

REFERENCES

APPENDIX E

REFERENCES

1. "Flood Hydrograph Package (HEC-1) Users Manual for Dam Safety Investigations", U.S. Army Corps of Engineers, Hydrologic Engineering Center, September 1979.
2. "Seasonal Variation of the Probable Maximum Precipitation, East of the 105th Meridian for Areas from 10 to 1,000 Square Miles, and Durations of 6, 12, 24 and 48 Hours", Hydrometeorological Report No. 33. Weather Bureau, U.S. Department of Commerce, April 1956.
3. "Recommended Guidelines for Safety Inspection of Dams", Department of the Army, Office of the Chief of Engineers, Appendix B.
4. "New England Upland Section", Internal Report, Civil Engineering Department, Purdue University, West Lafayette, Indiana, August 1977.
5. Geologic Map of New York, The University of the State of New York, The State Education Department, Map and Chart Series No. 5, Albany, New York, 1962.

DATE
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